May 20, 2020

To: All Domestic Employees

From: Pandemic Working Group

Re: **COVID-19: Canines in Training ~ Hydroxychloroquine ~ Spreading by Cluster**

Man's Best Friend. In the realm of potential detection technology, we have read about masks that light up when a person has COVID and heart patterns recorded from wearables that might indicate the onset of the disease. Now, as reported by SkyNews (thanks, Suneet), researchers in the U.K. are taking samples of the odor from COVID-19 patients and training six dogs – labradors and cocker spaniels – to distinguish that smell from that of people who are not infected. The British government is providing funding of £500,000 toward these trials, which are being conducted by the London School of Hygiene, Durham University and the charity Medical Detection Dogs, as part of a larger program to find non-invasive ways to detect the virus early. Interestingly, Medical Detection Dogs has already trained dogs to detect Parkinson's disease, malaria and some forms of cancer. These canines (like the one pictured here from SkyNews) can detect the odor of a disease at the equivalent dilution of one teaspoon of sugar in two Olympic sized swimming pools. If successful, each dog could check up to 250 people per hour in places like airports, train stations and public gatherings.

Hydroxychloroquine. As many of you know, earlier in the week, President Trump surprised reporters at a press conference by revealing that he has been taking hydroxychloroquine for the past week-and-a-half as a preventative measure against the coronavirus. This, in turn, engendered a tremendous amount of media activity and commentary. In the interest of providing our readers with data (and leaving the political commentary to others), we can put this drug into context. According to Medscape (a free app of peer-reviewed studies and analysis by physicians), hydroxychloroquine is used primarily as a preventative drug for malaria as well as a treatment for lupus and arthritis. While having anti-inflammatory and immunomodulatory effects, its mode of action for these diseases is unknown.

As you may recall, as reported by the New York Times, a few early, studies from China and France showed that this drug, when combined with azithromycin, seemed to help some patients; however, those studies were small, lacking in control groups, applied to mildly ill persons and, frankly, invited broader studies. In light of these studies, the President has indicated his confidence in the drug over the past several weeks. Nevertheless, hydroxychloroquine is not presently approved by FDA for use as either a preventative medication or a therapeutic against

coronavirus. It had been given an emergency use authorization by FDA to allow administration by hospitals with mixed, inconclusive results. The drug is now undergoing clinical trials across the world, including one by the National Institutes of Health, about which Dr. Anthony Fauci (as quoted in Medscape) said, “We need solid data from a large, randomized, controlled clinical trial to determine whether this experimental treatment is safe and can improve clinical outcomes.” Like many drugs, hydroxychloroquine may have side effects, including with respect to heart function. In short, the jury is out with respect to whether this drug has any benefit with respect to COVID-19. What the President chooses to do for his own personal or health reasons under the supervision of a physician (whom he can see every day) should have no bearing on our choices. We should know soon enough whether hydroxychloroquine passes muster.

How Does it Spread? In an interesting piece from ScienceMag.org from yesterday (“Why do some COVID-19 patients infect many others, whereas most don’t spread the virus at all?”), the author asserts that various “superspreading events” that have occurred with this pandemic have led experts (such as Adam Kucharski of London School of Hygiene & Tropical Medicine) to conclude that “probably about 10% of the cases lead to 80% of the spread.” The examples are well known – a choir practice of 61 people in Mount Vernon, Washington that led to 53 infections, a dormitory outbreak in Singapore that engendered 800 cases, meat processing facilities (photo from

ScienceMag.org) and nursing homes that have experienced major outbreaks. For diseases that tend to spread in clusters, like coronavirus, experts are focusing on what factors give rise to this effect. The factor that the scientists are closest to understanding is where COVID-19 clusters are likely to occur – clearly, there is a higher risk in enclosed spaces than outdoors. Chinese researchers recently reported that of the 318 clusters (of three or more cases) over a five-week period, only one originated outdoors. Timing may also play a role, as evidence is now suggesting that COVID-19 patients are most infectious for a short period of time. If public health workers knew where the next cluster would be, they could try to prevent them from occurring and avoid otherwise closing broad swaths of society. However, that knowledge is not fully within our ken just yet.

If you have any questions or comments on this advisory, please contact either kellyw@amvac.com or timd@amvac.com .