* The COVID-19 pandemic is real bad.
* It has a “sweet spot” case fatality rate.
* In the elderly and immocompromised, it overwhelms the alveoli in the lungs.
* Patients who can fight it simply get a cough and fever, which leads them to spread it like a normal community-acquired infection.
* It spreads very easily
* through aerosols produced by coughing or sneezing
* it lives outside of a host for several days
* Measures to contain it have rocked the economy.
* Social distancing has caused schools, restaurants, and gatherings to be closed.
* Attempts at economic stimulus are thought to be futile without addressing the root of the problem, i.e. the virus itself.
* There is a high probability of more outbreaks like this in the future.
* Infections are thought to come from animal reservoirs.
* The best way to contain an epidemic requires the ability to identify cases rapidly.
* You test an infected person’s contacts, and their contacts, and quarantine anyone who tests positive.
* The most sensitive test is PCR. The most useful of these is a “realtime” PCR.
* It’s complicated to perform and is easy to mess up.
* Automated systems for realtime PCR have been proposed, but no commercial packages exist.
* There is little profit motive for hospitals to buy machines that can perform tests at high capacity, because they would spend most of their time sitting idle.
* Therefore, manufacturers have not come forward with solutions that are simple to use and can perform realtime PCR at scale.
* The VA has a “fourth mission” of caring for ailing civilians in times of crisis.
* It is uniquely poised as a public health system to absorb the cost of unprofitable, but important capabilities.
* It could pay for realtime PCR machines, creating a market for companies to produce equipment that will save both lives and economic productivity.
* It could use the machines during times between epidemics to provide better care for veterans,.
* For instance, it could more easily contain the spread of MRSA that was in part due to the fact that protein-based tests are less sensitive.
* We propose a two-phase solution to the assist the community and the VA to stop the spread of COVID-19:
* To address the current outbreak, we propose to work with vendors to rapidly increase the capability of skilled technicians to perform realtime PCR.
* Hiring, training, and equipment.
* First we work with local hospitals
* When we have capapcity, we start sending swab kits to people's homes
* To better address future outbreaks, we propose that the VA commit to buying realtime PCR machines that are capable of processing a large number of samples in a short time period.
* They should be operable with a low level of training.
* Essentially, just insert the swab(s) and push the button.
* They should produce results that are easy to interpret.
* They should include a maintenance plan that includes easy replacement of reagents.
* They should be adaptable enough to allow for rapid addition of tests for new nucleotide sequences in the event of the next outbreak.
* The VA will commit to purchasing {x} of these machines for ${y} dollars, with ${z} dollars per year for 20 years going toward maintenance of the machines.